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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,753	02/28/2002	Toshihito Tsuga	TI-31620	8409

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EXAMINER

KORNAKOV, MICHAIL

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/085,753

Applicant(s)

TSUGA ET AL.

Examiner

Michael Komakov

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 12/08/2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 12/03/2003 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of copending Application 10/085,725 has been reviewed and is accepted. The terminal disclaimer has been recorded.
2. The cancellation of claims 4, 6 and 7 is acknowledged in Applicants' Reply dated 12/08/2003.
3. Claims 1-3, 5, 8 and 9 are pending. Claim 9 is withdrawn from consideration.
4. Claim 1 has been amended to introduce the limitations of 0.3ppm to 0.499 ppm of hydrogen in ultra-pure water. This limitation has not been initially present in the independent claim1. Dependent claim 7 (now cancelled) contained the range of hydrogen 0.3 ppm to 0.8 ppm.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-3, 5 and 8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably

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convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The analysis of changing numerical range limitations to the recited range of "0.3 ppm-0.499 ppm" (as presently amended) does not enable one skilled in the art to consider inherently supported by the discussion in the original disclosure. The original disclosure ONLY exemplifies the range 0.3-0.8 ppm, wherein each lower and upper ends of the range are only defined by one significant digit. Therefore the numerical value of 0.499 ppm is neither expressly nor inherently supported by the instant specification, consult in *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). A corresponding new claim limitation to "0.499 ppm" does not meet the description requirement, see also MPEP 2163.05. See also *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1328, 56 USPQ2d 1481, 1487 (Fed. Cir. 2000). The specification does not clearly disclose to the skilled artisan that the inventors considered the specific limitation of 0.499 ppm to be the part of their invention.

Claim Objections

7. Claim 1 is objected to because of the following informalities: the lower limit of recited range is 0.3 ppm (**has one significant digit**), while the upper limit of the range is 0.499 ppm (**has three significant digits**). Apparently, the same number of significant digits in both lower and upper limits of concentrations for experimental data, obtained by the same method of analysis would be appropriate.

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8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuno, Pregrant Publication (US 2001/0009155).

Matsuno discloses a method for removal fine particles from semiconductor wafers, by treating the said substrate with ozone water, which has been prepared by dissolving an ozone containing gas in ultra-pure water (reads on the "first cleaning process", as instantly claimed); and treating the said substrate with hydrogen water, which has been prepared by dissolving a hydrogen containing gas in ultra-pure water (reads on the "second cleaning process", as instantly claimed), wherein the treatment with hydrogen water is enhanced by applying ultrasonic waves (page 12, claim 1; page 4, paragraph 0046). Matsuno teaches the preferable concentration of ozone in ozone water as being 10 ppm (reads on the limitations of claim 5) and the preferable concentration of hydrogen in hydrogen water as being 0.5 ppm or more. Matsuno also teaches treating the substrate with HF-containing water (reads on the "fourth cleaning process", as instantly recited in claim 3) after the step in which the substrate is treated with said ozone water, said hydrogen water. Matsuno specifically indicates that his cleaning method can be realized utilizing soaking treatments of substrate in ozone water and hydrogen water (page 10, paragraph 0087) and therefore the step of immersing substrate in respective cleaning solution is inherent in Matsuno's teaching.

The disclosure of Matsuno differs from the instantly amended claim 1 by specifying the range of hydrogen 0.3-0.499 ppm versus 0.500 ppm of Matsuno.

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Therefore the difference between Matsuno's concentration and that of the amended claim 1 is 0.001ppm. It is noted here that there is absolutely no showing of criticality of 0.499 vs. 0.5 ppm on this record. To the contrary the maximum rate of particle removal shown by Applicants on the graphs pages 13 and 14 of the instant Specification is at the concentration of hydrogen of approximately between 0.6 and 0.7 ppm, which is more than 0.5. Furthermore, pages 5, 8 and 12 of the instant Specification point out the range of hydrogen of only 0.3-0.8 ppm.

However, it is settled by the Court that a prima facie case of obviousness exists when the claimed range and the prior art range do not overlap, but are close enough (only 0.001 ppm difference!), such that one skilled in the art would have expected them to have the same properties, *Titanium Metals Corp. v. Banner*, 778 F.2d 775,783,227 USPQ 773,779 (Fed. Cir. 1985). Therefore, a person skilled in the art at the time the invention was made would have found obvious that concentration of 0.499 ppm of hydrogen ions provides the same results as concentration of 0.5 ppm of Matsuno based on minute difference of these concentrations in light of the above court decision.

With regard to claim 2, Matsuno does not specifically indicate the steps of cleaning substrate with ultra-pure water after treating the substrate with ozone water. However, Matsuno provides clear motivation to implement such steps by stating that after cleaning the substrate is rinsed with ultra-pure water as needed (page 4, paragraph 0050). Therefore, one skilled in the art, motivated by Matsuno's statement, would have found it obvious to rinse semiconductor substrate with ultra-pure after each

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treatment step of Matsuno in order to prevent redeposition of fine particles and inhibit activity of the particular treatment solution in Matsuno's method.

With regard to claim 8, Matsuno teaches soaking treatments of substrate in ozone water and hydrogen water as instantly claimed, but remains silent about 3-20 minutes of treatment time. It is noticed here, that durations of substrate treatment in ozone water and in hydrogen water are result effective parameters, because they affect the level of removal of respective fine particles and therefore the cleanness of substrate surfaces. However, discovery of optimum value of result effective variables in known process is ordinarily within the skill in the art and would have been obvious, consult *In re Boesch and Slaney* 205 USPQ 215 (CCPA 1980).

Response to Arguments

9. Applicant's arguments with respect to claims 1-3, 5 and 8 have been considered but **are moot in view of the new ground(s) of rejection.**

However, Examiner would like to address Applicants statement that the disclosure of Matsuno "negates this range" as presently amended in claim 1 (0.3-0.499 ppm vs. 0.5 ppm of Matsuno). In support of such statement, Applicants cite paragraph [0042] and claim 7.

It is the Examiner's position that in paragraph [0042] Matsuno teaches "concentration of hydrogen in the hydrogen water may preferably be 0.5 ppm or higher" Thus, Matsuno refers **to a preferred embodiment**. Further in the same paragraph Matsuno refers to **non-preferred embodiment**: "... a hydrogen concentration lower

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than 0.5 may require too much time in some instances..." Applicants are reminded that disclosed preferred embodiments do not constitute a teaching away from a **broader disclosure or non-preferred embodiments**. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, **including non-preferred embodiments**. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998).

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. Kornakov
3/5/04

Michael Kornakov
Examiner
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